
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Hood River Production Program - M&E

BPA project number: 8805303

Contract renewal date (mm/yyyy): 10/1999 ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Confederated Tribes of the Warm Springs Reservation of Oregon

Business acronym (if appropriate) CTWSRO

Proposal contact person or principal investigator:

Name	<u>Michael Lambert</u>
Mailing Address	<u>3430 W 10th</u>
City, ST Zip	<u>The Dalles, OR 97058</u>
Phone	<u>541-296-6866</u>
Fax	<u>541-296-8886</u>
Email address	<u>hoodriverproject@netcnct.net</u>

NPPC Program Measure Number(s) which this project addresses
7.4L.1, 7.4L.2, 7.4N.1, 7.4N.2

FWS/NMFS Biological Opinion Number(s) which this project addresses

Other planning document references

CRITFC. 1996. WY-KAN-USH-MI WA-KISH-WIT, Cited: Volume II:25-26.

Department of Natural Resources, CTWS, October 1993. Hood River/Pelton Ladder Master Agreement. Cited: entire document.

DOE and BPA. March 1996. Draft Environmental Impact Statement (DOE/EIS-0241). Cited: entire document.

DOE and BPA. July 1996. Final Environmental Impact Statement (DOE/EIS-0241). Cited: entire document.

ODFW and CTWS. September 1990. Hood River Subbasin Salmon and Steelhead Production Plan.

NPPC. 1992. NPPC approval letter for the Hood River Master Plan. April 16, 1992.

NPPC. 1994. Columbia River Basin Fish and Wildlife Program. Adopted November 15, 1982. Amended December 14, 1994.

O'Toole, P., and ODFW. 1991a. Hood River Production Master Plan. Cited: entire document.

Short description

Implement, monitor, and evaluate actions outlined in the Hood River and Pelton Ladder Master Plans pertaining to smolt production, acclimation, and habitat. Coordinate Pelton Ladder production.

Target species

Spring chinook salmon (*Oncorhynchus tshawytscha*), summer and winter steelhead (*Oncorhynchus mykiss*)

Section 2. Sorting and evaluation

Subbasin

Hood, Deschutes

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
<input checked="" type="checkbox"/> Anadromous fish <input type="checkbox"/> Resident fish <input type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Multi-year (milestone-based evaluation) <input type="checkbox"/> Watershed project evaluation	<input type="checkbox"/> Watershed councils/model watersheds <input type="checkbox"/> Information dissemination <input type="checkbox"/> Operation & maintenance <input type="checkbox"/> New construction <input checked="" type="checkbox"/> Research & monitoring <input checked="" type="checkbox"/> Implementation & management <input type="checkbox"/> Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
20513	Hood River / Fifteenmile Creek
8902900	Hood River Production Program / Round Butte Hatchery production and Pelton
9500700	Pelton Ladder Hood River Production / PGE O&M
8805304	Hood River Production Program / ODFW M&E
9301900	Hood River Production Program - Oak Springs, Powerdale, and Parkdale / O&M
9802100	Hood River Fish Habitat Project / Implement habitat improvement actions

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1995	Completed physical stream inventories of anadromous salmonid bearing streams located on all private and selected USFS lands in the Hood River subbasin.	Yes. Surveys accurately recorded important habitat attributes and deficiencies within subbasin streams.
1995	Completed construction of rearing cells in Pelton Ladder.	Yes. Finish reared spring chinook salmon from the 1994-96 broods.
1996	Completed development of the winter steelhead acclimation facility on the East Fork Hood River.	Yes. All hatchery reared winter steelhead smolts have been acclimated from 1996-98. Early results show a significant increase in smolt outmigration.
1996	Completed development of the West Fork Hood River spring chinook salmon acclimation sites (portable acclimation ponds with gravity fed pipe system).	Yes. Spring chinook salmon smolts have been acclimated from 1996-1998.
1996	Powerdale Trapping Facility completed.	Yes. Facility has been in continuous operation since completion. All anadromous fish are trapped and sorted at Rm 4.0 on the mainstem Hood River.
1996	Determined what subspecies of <i>O. mykiss</i>	Partly. Tissue samples for genetic

	and <i>O. clarki</i> exist in the subbasin and if there are any sensitive gene pools that may be impacted by HRPP actions.	analysis were collected from the Hood River subbasin streams from 1994-96. Analysis continues.
1996	Completed a radio telemetry study to assess the upstream migration of adult salmonids in the lower Hood River (Rm 0.0-4.0).	Yes. Documented migration of spring and fall chinook salmon and summer steelhead, fish movement through the fish ladder at Powerdale Dam (Rm 4.0), and possible effects of streamflow in the bypass reach and the powerhouse tailrace of fish migration.
1997	Hood River Production Program EIS completed.	Yes. The EIS established interim objectives for smolt production through 2002.
1997	Determination of spatial distribution for anadromous adult holding and spawning was completed in 1997	Yes. Spatial distribution for summer and winter steelhead, spring and fall chinook and coho salmon have been determined in the Hood River subbasin.
1997	Rearing density estimates for indigenous fish populations in the Hood River subbasin were made for selected sites from 1994-1997.	Yes. Estimated numbers of indigenous Hood River fish populations were completed at selected sites.
1997	The East Fork Irrigation District 130 cfs diversion on the East Fork Hood River was equipped with fish screens.	Yes. Screening will prevent direct fish loss of downstream migrants into the irrigation distribution system.
1998	Spring chinook salmon spawning ground surveys on the West Fork Hood River were completed from 1997-1998.	Yes. Baseline information on spawning distribution and abundance, spawn timing, prespawn mortality and fish health, and spawner origins and sex ratios.
1998	Parkdale Fish Facility completed and operational.	Yes. Spring chinook salmon and summer steelhead broodstock have been held. About 40,000 spring chinook eggs were collected and incubated until eyed stage before transfer to Round Butte.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Determine abundance, distribution, and life history patterns of anadromous and	a	Estimate juvenile rearing distribution of anadromous and resident species.

	resident fishes in the Hood River subbasin.		
		b	Estimate rearing densities or relative abundance of juvenile anadromous salmonids and resident trout in selected reaches.
		c	Estimate spatial distribution or rearing juvenile anadromous salmonids and resident trout.
		d	Estimate selected morphometric characteristics of resident trout (e.g. mean fork length, mean weight).
		e	Assist ODFW in enumeration of all species of upstream migrant anadromous salmonids at Powerdale Dam.
		f	Assist ODFW in monitoring naturally produced and acclimated hatchery produced smolt outmigration timing at migrant traps.
		g	Evaluate if acclimation facilities have significantly increased numbers of hatchery smolts leaving the Hood River subbasin.
		h	Estimate and compare median date of outmigration for naturally produced and acclimated hatchery produced smolts.
		i	Evaluate significance of "residualism" using electrofishing and snorkel surveys.
		j	Determine if acclimated hatchery spring chinook salmon adult returns distribute throughout the West Fork and utilize primary spawning areas.
		k	Determine if acclimated smolts have a significantly higher smolt to adult survival rate in relation to direct released smolts.
		l	Coordination of all monitoring and evaluation activities. Provide informational reports to agencies and public on project activities. Prepare BPA annual report.
2	Identify the population genetic	a	Provide support to conduct

	structure, systematics, and distribution of genetically unique steelhead, cutthroat, and resident trout populations in the Hood River subbasin.		laboratory work on the electrophoretic and mtDNA analysis. Work will be completed by University of Montana, contracted by ODFW. A report summarizing results will be submitted to CTWS.
3	Develop fish culture procedures for steelhead and spring chinook to minimize future genetic impacts to the wild gene pools in the Hood River subbasin.	a	Periodically re-evaluate the HR/PLPP management plans and broodstock collection, spawning, and adult fish passage protocol for summer and winter steelhead and spring chinook salmon to minimize future genetic impacts.
4	Achieve an interim run of 850 jack and adult spring chinook salmon to Hood River, with a spawner escapement of 400 jacks and adults.	a	Volitionally release acclimated hatchery smolts into the Hood River subbasin.
		b	Coordinate clipping and coded-wire tagging operations for hatchery releases into the Hood.
5	Achieve an interim run of 2,340 summer steelhead to Hood River, with a spawner escapement of 1,000 (500 wild and 500 hatchery) Hood River stock	a	Volitionally release acclimated hatchery smolts into the Hood River subbasin.
		b	Coordinate clipping and coded-wire tagging operations for hatchery releases into the Hood.
6	Achieve an interim run of 2,785 winter steelhead to Hood River, with a spawner escapement of 1,000 (500 wild and 500 hatchery) Hood River stock.	a	Volitionally release acclimated hatchery smolts into the Hood River subbasin.
		b	Coordinate clipping and coded-wire tagging operations for hatchery releases into the Hood.
7	Determine the amount and condition of habitat available to anadromous salmonids in the Hood River subbasin.	a	Monitor selected environmental factors that may effect carrying capacity.
		b	Estimate the quantity and quality of habitat available for spring chinook salmon and summer and winter steelhead.

		c	Reevaluate and refine smolt carrying capacity.
		d	Complete physical habitat surveys.
8	Restore and recover habitat lost as a consequence of man's activities in the Hood River subbasin.		Plan, coordinate, and implement habitat projects from the Hood River Habitat Restoration/Protection Plan working document. Seek cost sharing funds for all projects.
			Continue to update and modify the habitat protection, restoration, and monitoring plan. Incorporate components of the watershed assessments, completed by the Hood River Watershed Group with HRPP support, and the USFS.
9	Review measures of relative "smolt quality" between fish reared in Pelton Ladder (old and new sections) and fish reared at Round Butte Hatchery (RBH), as inference that ladder-reared smolts may have superior "fitness" for survival.	a	Utilize past data from several broods of ladder reared and RBH reared smolts. Compile and analyze data to provide a comparison of relative "fitness" between the groups of fish.
		b	Determine and compare smolt survival and condition of fish in Pelton Ladder.
		c	Summarize and report jack and adult life history and morphological data on Deschutes River stock spring chinook salmon released from Pelton Ladder and RBH.
		d	Determine and compare smolt to adult survival rates of similar sized smolts released at the same time from RBH and Pelton Ladder (Pond H-1 vs. cells 1,2, and 6; pond H-2 vs. cell 3).
10	Conduct controlled tests at Pelton Ladder to define effective smolt production criteria that maximizes adult returns.	a	Determine and compare smolt to adult survival of fish transferred to Pelton Ladder in September and November.
		b	Determine and compare smolt to adult survival rates of small (12/lb at release; cell L-3) and medium (8/lb at release; cell L-6) size smolts reared

			at Pelton Ladder.
		c	Determine and compare smolt to adult survival rates of small (12/lb at release; pond H-2) and medium (8/lb at release; pond H-1) size smolts reared at RBH.
		d	Document fish culture activities that occur at RBH and Pelton Ladder.
		e	Coordinate (assist) with RBH staff in sampling fish at the hatchery and ladder for condition factors prior to release.
		f	Coordinate (assist) with RBH staff in retrieving coded-wire tags from jack and adult spring chinook collected at the Pelton Trap.
11	Measure survival of smolts produced in the (new) modified sections of Pelton Ladder and compare to (old) established pre-modification survival rates.	a	Determine and compare smolt to adult survival of cells 1 and 2 (old section) with cell 6 (new section).
		b	Calculate and compare survival rates of historic smolt releases from the old ladder section and hatchery.
12	Evaluate the effective production potential of the currently, unused area in Pelton Ladder.	a	Measure adult returns provided by the new modifications to Pelton Ladder to gain inferences about the potential value of further extending production in the ladder.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	10/1999	9/2000	A) Collect abundance, distribution, and life history information on fishes in the Hood. B) Acclimating and volitionally releasing smolts resulted in an increased smolt outmigration, smolt-to-		18.10%

			adult survival, and a minimal affect to wild fish.		
2	10/1999	9/2000	A) Identify the population structure, systematics, and distribution of steelhead and cutthroat trout. B) Historic steelhead, rainbow trout, and cutthroat trout hatchery releases have not had a genetic impact on the indigenous populations.	Tissue samples for genetic analysis were collected from the Hood River subbasin streams from 1994-1996. The objective 2 milestones will be completed by FY 2000.	8.30%
3	10/1999	9/2000			6.10%
4	10/1999	9/2000	Achieve an interim adult return of 850 hatchery spring chinook salmon to the mouth of the Hood River (see Hood River/Fifteenmile Creek Umbrella for long range run size objectives).	The acclimation and volitional release of spring chinook salmon into the Hood River subbasin milestone will be accomplished in FY 2000. The adult return milestone will be attainable by FY 2002.	11.30%
5	10/1999	9/2000	Achieve an interim adult return of 1800 hatchery summer steelhead to the mouth of the Hood River (see Hood River/Fifteenmile Creek Umbrella for long range run size objectives).	The adult return milestone will not be attainable for several years. The first release of Hood River stock smolts is scheduled for the spring of 1999.	11.30%
6	10/1999	9/2000	Achieve an interim adult return of 2250 hatchery winter steelhead to the mouth of the Hood River (see Hood River/Fifteenmile Creek Umbrella for long range run size objectives).	The acclimation and volitional release of winter steelhead into the Hood River subbasin milestone will be accomplished in	11.20%

				FY 2000. The adult return milestone will be attainable by FY 2002.	
7	10/1999	9/2000	Refine smolt carrying capacity for summer and winter steelhead and spring chinooks salmon	This milestone will be attainable by FY 2002.	5.70%
8	10/1999	9/2000			8.70%
9	10/1999	9/2000	Finish rearing spring chinook salmon smolts in a semi-natural environment produces a higher smolt-to-adult survival rate.	This milestone will be attainable by FY 2002.	4.90%
10	10/1999	9/2000	A) mean size at release of ladder-reared and hatchery-reared smolts will not significantly affect smolt-to-adult survival rates.	This milestone will be attainable by FY 2002.	4.90%
11	10/1999	9/2000	Survival to adults of smolts produced in the new section of Pelton Ladder will be no different than survival of smolts produced in the old section.	This milestone will be attainable by FY 2002.	4.90%
12	10/1999	9/2000	Smolts reared in the new modified section of Pelton Ladder have a \geq smolt-to-adult survival rate as those reared in the old section.	This milestone will be attainable by FY 2002.	4.60%
				Total	100.00%

Schedule constraints

This is an ongoing monitoring and evaluation project. For purposes of this proposal, objectives described above were ended on 09/2000 (end of the FY 2000 contract period) but does not represent the actual end date of those objectives.

Completion date

Ongoing

Section 5. Budget

FY99 project budget (BPA obligated): \$500,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel		% 35	176,475
Fringe benefits	@ 23%	% 8	40,589
Supplies, materials, non-expendable property		% 5	26,750
Operations & maintenance			0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	radio repeater and equipment	% 2	12,000
NEPA costs			0
Construction-related support			0
PIT tags	# of tags:		0
Travel		% 8	40,450
Indirect costs	@ 41.4%	% 26	130,784
Subcontractor		% 8	41,200
Other	office rent, utilities	% 6	31,640
TOTAL BPA FY2000 BUDGET REQUEST			\$499,888

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
Confederated Tribes of the Warm Springs Reservation of Oregon	Assist in spring chinook salmon spawning ground surveys.	% 0	300
East Fork Irrigation District	Acclimation site for winter steelhead on the East Fork Hood River	% 1	10,000
Long View Fibre Company	Use of the West Fork Hood River acclimation site and site preparation	% 0	2,500
Salmon Corps - CTWSRO	Assist in setup of acclimation ponds and piping.	% 1	10,000
U.S. Forest Service	Complete EIS for acclimation sites and assist in spring chinooks salmon spawning	% 0	3,000

	ground surveys.		
AmeriCorp	Assist in setup of acclimation ponds and piping, provide overnight caretaker services of the acclimation facility	% 3	20,000
Total project cost (including BPA portion)			\$545,688

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$520,000	\$540,000	\$560,000	\$580,000

Section 6. References

Watershed?	Reference
<input type="checkbox"/>	CRITFC. 1996. WY-KAN-USH-MI WA-KISH-WIT. The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes. Portland, Oregon.
<input type="checkbox"/>	CTWS and ODFW, cooperators. 1996. Annual progress report. Hood River and Pelton Ladder evaluation studies. Annual Progress Report of the CTWS and ODFW (Projects 88-053-03 and 88-053-04) to Bonneville Power Administration (BPA), Portland, Oregon.
<input type="checkbox"/>	CTWS and ODFW, cooperators. January 1998. Annual progress report. Hood River and Pelton Ladder evaluation studies. Annual Progress Report of the CTWS and ODFW (Projects 88-053-03 and 88-053-04) to BPA, Portland, Oregon.
<input type="checkbox"/>	CTWS and ODFW, cooperators. In Print. Annual progress report for FY1997. Hood River and Pelton Ladder evaluation studies. Annual Progress Report of the CTWS and ODFW (Projects 88-053-03 and 88-053-04) to BPA, Portland, Oregon.
<input type="checkbox"/>	Department of Natural Resources, Confederated Tribes of the Warm Springs Reservation of Oregon. October 1993. Hood River/Pelton Ladder master agreement. Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	DOE and BPA (U.S. Department of Energy and Bonneville Power Administration). March 1996. Hood River fisheries project. Draft Environmental Impact Statement (DOE/EIS-0241). Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	DOE and BPA (U.S. Department of Energy and Bonneville Power Administration). July 1996. Hood River fisheries project. Final Environmental Impact Statement (DOE/EIS-0241). Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	NEOH Project (Northeast Oregon Hatchery Project). 1991. Hood River Master Plan. Draft monitoring and evaluation plan produced for NPPC's

	Monitoring and Evaluation Group review. CTWS, Warm Springs, Oregon.
<input type="checkbox"/>	Northwest Power Planning Council (NPPC). 1987. Columbia River basin fish and wildlife program. Portland, Oregon.
<input type="checkbox"/>	NPPC. 1989. Documentation from System Planning Model. Monitoring and Evaluation Group. Portland, Oregon.
<input type="checkbox"/>	NPPC. 1992. NPPC approval letter for the Hood River Master Plan to Zane Jackson, Chairman, CTWS. April 16, 1992.
<input type="checkbox"/>	NPPC. 1994. Columbia River Basin Fish and Wildlife Program. Adopted November 15, 1982. Amended December 14, 1994. Northwest Power Planning Council, Portland, Oregon.
<input type="checkbox"/>	ODFW. 1995. Aquatic Inventories Project: Physical Habitat Surveys, Fish Surveys, Hood River subbasin.
<input type="checkbox"/>	ODFW and CTWS. September, 1990. Hood River Subbasin Salmon and Steelhead Production Plan.
<input type="checkbox"/>	Olsen, E.A., R.A. French, and J.A. Newton. 1994. Hood River and pelton ladder evaluation studies. Annual Progress Report of CTWS and ODFW (Projects 88-053-04 and 88-053-03) to BPA, Portland, Oregon.
<input type="checkbox"/>	O'Toole, P., and ODFW. 1991a. Hood River production master plan. Final report of the CTWS and the ODFW (Project 88-053, Contract DE-BI79-89BP00631 to BPA, Portland, Oregon.
<input type="checkbox"/>	O'Toole, P., and ODFW. 1991a. Hood River production master plan (Appendices). Final report of the CTWS and the ODFW (Project 88-053, Contract DE-BI79-89BP00631 to BPA, Portland, Oregon.
<input type="checkbox"/>	Seber, G.A.F. and J.F. Whale. 1970. The removal method for two and three samples. Biometrics:393-400.
<input type="checkbox"/>	Smith, M. and the CTWS. 1991. Pelton ladder master plan. Final Report of ODFW and CTWS (Project 89-029, Contract DE-BI79-89BP01930) to BPA, Portland, Oregon.
<input type="checkbox"/>	Zippin, C. 1958. The removal method of population estimation. Journal of Wildlife Management 22(1): 82-90.
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PART II - NARRATIVE

Section 7. Abstract

The HRPP is a fish supplementation project in the lower Columbia Basin, jointly implemented by the CTWS and the ODFW. The goal of the HRPP is to restore summer

and winter steelhead populations and reestablish spring chinook salmon using supplementation techniques in accordance with the Hood River Production Master Plan (1991). In February, 1991, the NPPC separated the Hood River portion of the NEOH and linked it with the Pelton Ladder Project. This was because: (1) the Pelton Ladder Master Plan identified the Hood River subbasin as a destination for spring chinook salmon smolts produced by the Pelton Ladder Project (Smith 1991), and (2) the Hood River Production Master Plan identified a need for the spring chinook salmon production (O'Toole 1991). The NPPC approved the Hood River and Pelton Ladder Master Plans in 1992. In accepting the Hood River Production Master Plan, the NPPC recommended a three-phased approach which included collecting baseline information, project implementation and facilities construction, and follow-up monitoring and evaluation studies. Comprehensive collection of data began in December, 1991, including information on the natural production, smolt to adult survival, escapement, harvest, life history, and several morphological and meristic parameters needed to characterize wild and hatchery anadromous salmonid stocks and resident trout (CTWS and ODFW January 1998). Information collected by the HRPP was used to prepare an environmental impact statement evaluating the program's impact on the human environment (DOE and BPA 1996). Studies for Pelton Ladder to evaluate the effect of the new cells on the existing production were implemented in 1996. Information collected by this M&E project will be used to (1) determine the current status of indigenous populations of resident and anadromous salmonids, (2) identify measures that will minimize any potentially detrimental impacts the HRPP could have on indigenous populations of resident trout and anadromous salmonids, and (3) develop and fine tune management guidelines that will optimize the benefits associated with the HRPP.

Section 8. Project description

a. Technical and/or scientific background

The Hood River subbasin is home to four species of anadromous salmonids: chinook salmon, coho salmon, steelhead, and sea run cutthroat trout. Indigenous spring chinook salmon were extirpated during the late 1960's. The naturally spawning spring chinook salmon currently present in the subbasin are progeny of Deschutes stock. The historical Hood River subbasin hatchery steelhead program utilized out-of-basin stocks for many years. Recently the indigenous stocks of summer and winter steelhead have been determined by ODFW to be at a moderate to high risk of extinction and NMFS has included these steelhead stocks in the ESA designation of a "Threatened" species.

The HRPP is a fish supplementation project in the lower Columbia Basin funded by BPA and jointly implemented by the CTWS and ODFW. The primary goals of the HRPP are to (1) re-establish naturally sustaining spring chinook salmon using Deschutes stock in the Hood River subbasin, (2) rebuild naturally sustaining runs of summer and winter steelhead in the Hood River, (3) maintain genetic characteristics of the population, and (4) contribute to tribal and non-tribal fisheries, ocean fisheries, and the Northwest Power

Planning Council's (NPPC) goal of doubling salmon runs in the Columbia Basin (O'Toole, P. and ODFW 1991a).

In accepting the Hood River Production Master Plan, the NPPC recommended adopting a three-phased approach which included collecting baseline information, project implementation and facilities construction, and follow-up monitoring and evaluation studies. Comprehensive collection of data began in the Hood River subbasin in late, 1991, including information on the life history and production of anadromous salmonid stocks and habitat availability and inadequacy (CTWS and ODFW, cooperators, January 1998). In 1996, an Environmental Impact Statement was completed for the HRPP cooperatively by BPA, CTWS, and ODFW. A record of decision was completed 10 October, 1996 by Randy Hardy (Administer of BPA); which supports the NPPC goals (DOE and BPA, March & July 1996).

In Section 7 of the 1994 version of the Columbia River Basin Fish and Wildlife Program, the NPPC recommended that implementation of production and habitat be fully coordinated (NPPC 1994). The Tribes, in Volume II of the Spirit of the Salmon Plan, support the NPPC in the need for a combination of supplementation and habitat restoration project. "Restoration of the anadromous fish populations in the Hood River subbasin will need to incorporate a combination of improved natural fish production and supplementation with cultured fish. Improved natural production could occur through improvements in the screening of irrigation diversions, habitat restoration and passage restoration (CRITFC 1996)."

The HRPP includes a number of physical facilities that have been recently developed or are currently in the development process (CTWS and ODFW, cooperators, 1996 and January 1998). HRPP implementation includes the Powerdale Dam Fish Facility, constructed in FY 97. This facility is a state of the art fish trapping and sorting facility which allows project personnel to efficiently trap, sort, and/or transport all the adult salmonids arriving at Powerdale Dam. The program also includes the recent completion of the Parkdale Fish Facility. This facility will provide adult broodstock holding and spawning facilities as well as juvenile acclimation ponds. The project also will include new egg incubation, early rearing, and smolt rearing facilities at Oak Springs Fish Hatchery. Construction of these facilities will be complete in Fall of 1998. Other important physical facilities associated with the HRPP project include three fish rearing cells in the PGE Pelton Fish Ladder, steelhead acclimation ponds on the East Fork Hood River (provided at no charge by the East Fork Irrigation District), and temporary fish acclimation ponds located on Longview Fibre Company property on the West Fork Hood River.

Current and previous contracts have funded work which has provided stock specific empirical data on resident trout and wild, natural and hatchery produced anadromous salmonids in the Hood River subbasin (Olsen et al. 1994, Olsen et al. 1995, CTWS and ODFW, cooperators, 1996, January 1998, and In Print). Annual progress reports document information collected on 1) juvenile rearing densities, 2) subbasin smolt

production, 3) the percentage of acclimated and direct released hatchery summer and winter steelhead smolts that leave the subbasin from a given production release, 4) wild and hatchery smolt to adult survival rates (i.e., preliminary estimates), 5) jack and adult escapements and harvest, 6) spatial distribution of adult holding, 7) life history patterns, and 8) selected morphological and meristic characteristics. This quantitative data has been used to more accurately define 1) the spatial distribution of spawning and rearing populations of anadromous salmonids; 2) the current status of indigenous populations of wild summer and winter steelhead; 3) potential impacts the historical subbasin hatchery program may have had on indigenous populations of fish; 4) the current status of available anadromous salmonid habitat in the subbasin; 5) smolt to adult survival (i.e., preliminary estimates); and 6) the in-basin post-release survival of hatchery summer and winter steelhead production releases. Information has been used extensively to refine our approach to implementing the Hood River Production Program in a manner that will minimize the program's impact on indigenous populations of fish. In particular, data has been used to 1) determine the most suitable areas for releasing hatchery smolts into the subbasin, 2) develop criteria for collecting hatchery broodstock, 3) develop guidelines for implementing the hatchery supplementation program, and 4) refine our approach to releasing acclimated hatchery smolts into the subbasin.

This project has collected, summarized, and documented over the past five years a significant amount of stock specific information on juvenile and adult anadromous salmonids in the Hood River subbasin. While this information has been critical in implementing the HRPP in a biologically sound manner, the data set is still incomplete. The multiplicity of juvenile and adult steelhead life history patterns requires a data set collected over a much longer time frame to achieve this projects objectives.

A long term data set will also be required when we try to evaluate changes in subbasin smolt production and any impact the HRPP might have on indigenous populations of fish. The hatchery winter steelhead program was the first component of the HRPP to be implemented in the Hood River subbasin and, consequently, will be the first program that we will be able to evaluate. The 1993 brood is the first brood in which an estimate of subbasin wild steelhead production can be made for all age classes of downstream migrant smolts and returning adults. This is based on the fact that 1994 is the first year in which we estimated subbasin steelhead smolt production. Wild steelhead from the 1993 brood will migrate as freshwater age 1, 2, 3, and 4 smolts in 1994, 1995, 1996, and 1997, respectively. Then, depending on the freshwater age they migrate as smolts, adult steelhead will return as 1-, 2-, 3-, and 4-salt adults during the 1994-95 through 2001-02 run years. This complex life history pattern essentially precludes our ability to develop our first estimate of smolt to adult survival of wild steelhead until FY 2002. A similar situation also exists with evaluating the acclimation facilities. Complete brood returns from the first release of acclimated hatchery winter steelhead smolts (1995 brood) will not be available until completion of the 1999-2000 run year (FY 2000). The first release of acclimated hatchery summer steelhead smolts (1998 brood) will not occur until the spring of 1999. Complete brood returns from this production release will not be available until completion of the 2003-04 run year (FY 2004). Determining a statistically significant

difference in survival rates would require estimates of smolt to adult survival for at least three to five brood releases of acclimated hatchery fish. This means that we would not be able to evaluate any changes in survival rate until at least FY 2002 for hatchery winter steelhead and FY 2006 for hatchery summer steelhead.

The Hood River subbasin is a very biologically complex system by virtue of the fact that the subbasin supports populations of virtually all species of resident trout and anadromous salmonids. They include wild populations of rainbow, cutthroat, and bull trout and summer and winter steelhead and natural populations of spring and fall chinook salmon and coho salmon. Juvenile and adult life history patterns are typically more complex for steelhead but resident trout and salmon also exhibit a diversity of patterns, although significantly fewer combinations may occur as is the case with coho salmon. This inherent biological diversity precludes a short term monitoring and evaluation project that can be used to evaluate the HRPP's hatchery supplementation program and its impact on indigenous populations of fish. Achieving the objectives stated in **Section 8e** below will require a long term commitment in terms of both dollars and personnel.

b. Rationale and significance to Regional Programs

In 1992, the Northwest Power Planning Council approved the Hood River and Pelton ladder master plans (O'Toole P. and ODFW 1991a and 1991b, and Smith and The CTWSRO 1991) within the framework of the Columbia River Basin Fish and Wildlife Program. Specifically, the project is consistent with sections 7.4L.1, 7.4L.2, 7.4N.1, and 7.4N.2, with a combination of supplementation and habitat restoration activities and Pelton Ladder studies. The master plans define an approach for implementing a hatchery supplementation program in the Hood River subbasin.

The primary goals of the HRPP are 1) to increase production of wild summer and winter steelhead (*Oncorhynchus mykiss*) and 2) to reintroduce spring chinook salmon (*Oncorhynchus tshawytscha*) into the Hood River subbasin. Harvest and escapement goals are identified in O'Toole and Oregon Department of Fish and Wildlife (1991a), O'Toole and Oregon Department of Fish and Wildlife (1991b), and Smith and The confederated Tribes of the Warm Springs Reservation of Oregon (1991). Strategies for achieving the production goals were initially devised based on various assumptions about subbasin carrying capacity, smolt to adult survival rates, and current escapements of anadromous salmonids to the Hood River subbasin. To obtain the information needed to more accurately estimate each parameter this project proposes operating an adult migrant trap at Powerdale Dam to collect life history and escapement information on jack and adult anadromous salmonids escaping to the Hood River subbasin. This project also proposes operating several juvenile downstream migrant traps to collect life history and subbasin smolt production estimates for wild steelhead and salmon and to collect information on in-basin post-release survival of

hatchery summer and winter steelhead smolts and hatchery spring chinook salmon smolts. Information collected at the adult and juvenile migrant traps will be used to 1) refine the wild, natural, and hatchery production goal's of the HRPP using subbasin and stock specific empirical data; 2) evaluate acclimation facilities operated under Contract Number 88-053-03; 3) develop guidelines for implementing the hatchery supplementation project implemented under Contract Numbers 93-019, 95-070, and 88-29; 4) evaluate the Pelton Ladder rearing facilities operated under Contract Number 88-29; 5) develop guidelines for implementing the hatchery supplementation program in a manner that will minimize the HRPP's impact on indigenous populations of resident and anadromous salmonids; and 6) develop and refine strategies for implementing the HRPP in a manner that will improve efficiency and programmatic benefits.

c. Relationships to other projects

The HRPP is composed of six separate contracts (Project # 9301900, 9500700, 8802900, 8805304, 8805303, and 9802100) that could impact the program if one or more contracts are not fully funded according to schedule. The six contracts primarily provide funding for four broad categories of activities. These include engineering, implementation, habitat, and monitoring and evaluation studies. Funding for the engineering component of the HRPP provides for construction of facilities at Powerdale Dam, Parkdale, and Oak Springs Hatchery that are required to fully implement the HRPP. Funding for implementation provides for broodstock collection, holding and spawning, rearing, and marking and tagging. Habitat funding is used for restoring degraded habitat to increase carrying capacity. Funding for monitoring and evaluation studies provides for the evaluation of the HRPP and interaction the hatchery program may be having on wild populations of fish. Inadequate, or loss of, funding for any component will jeopardize our ability to achieve project goals according to the time frame established in the EIS.

In section 7 of the 1994 version of the Columbia River Basin Fish and Wildlife Program, the NPPC reiterated its determination that implementation of production and habitat activities be fully coordinated (NPPC, 1994). In 1996, an Environmental Impact Statement was completed for the HRPP cooperatively by BPA, CTWSRO, and ODFW. A record of decision was completed October 10, 1996 by Randy Hardy (BPA Administrator); and supports NPPC goals. The decision was to proceed with Alternative 1, because it best met the needs and purposes stated in the Final EIS and has the best potential for re-establishing or rebuilding and sustaining populations of anadromous salmonids in the Hood River subbasin with a combination of supplementation, habitat improvement, and a monitoring and evaluation program (DOE and BPA, 1996).

There are a number of other, non-BPA funded, programs in the subbasin that have direct positive impacts on the success of the HRPP. For example, the

East Fork Irrigation District (EFID) has implemented new fish screening on their 130 cfs diversion from the East Fork Hood River. In the process of installing this new fish screen EFID constructed concrete sediment retention ponds. One of these ponds has been used for steelhead smolt acclimation. EFID is working with HRPP personnel to determine the most efficient type of fish screen to install at their second major diversion. The Middle Fork Irrigation District (MFID) has cooperated in the construction of the Parkdale facility, including the water supply tap into their powerhouse tailrace. MFID, in cooperation with the US Forest Service, has recently installed an upstream migrant fish trap at the base of Clear Branch Dam (Middle Fork Hood River). The Farmers Irrigation District (FID) has implemented instream habitat restoration on a major West Fork tributary. FID has been actively upgrading district fish screens and implementing water conservation measures. The Mount Hood National Forest has had an active stream habitat restoration program throughout the subbasin. Their work has included the placement of instream structures and large wood in each of the main Hood River tributaries with a goal of restoring instream habitat diversity. The Hood River Watershed Group is taking an active role in activities that will improve the overall condition of the Hood River watershed and streams. They recently provided their unqualified endorsement of a proposal that will allow the placement of salmon and steelhead carcasses in the Hood River streams to enhance primary stream productivity. PacifiCorp has provided the land needed for development of the Powerdale Fish Facility. They are currently undergoing FERC relicensing of Powerdale Hydroelectric Project which should result in major improvements to downstream migrant screening, instream minimum flows, overall water quality and development of an SOP for Powerdale Dam. Past improvements have been completed on the adult fish ladder.

d. Project history (for ongoing projects)

Measure 703(f)(5) of the Northwest Power Planning Council's (NPPC) 1987 Fish and Wildlife Program recommended that the Bonneville Power Administration investigate the feasibility of developing artificial production facilities for chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*) in the Hood, Umatilla, Walla Walla, Grande Ronde, and Imnaha rivers. These artificial production facilities, known as the Northeast Oregon Hatchery Project (NEOH), were to be used to supplement natural production in these rivers. Measure 703(f)(5) of the Program further stated that prior to design of the facilities, a Master Plan would be developed by the tribes and fish agencies for review and approval by the NPPC.

On 26 February, 1991, the NPPC agreed to separate the Hood River portion of the NEOH and link it with the Pelton Ladder Project. This was because: (1) the Pelton Ladder Master Plan identified the Hood River subbasin as a destination for spring chinook salmon smolts produced by the Pelton Ladder Project (Smith 1991), and (2) the Hood

River Production Master Plan identified a need for the spring chinook salmon production (O'Toole P. and ODFW 1991a and 1991b).

The NPPC accepted the Hood River Production Master Plan on 16 April, 1992, and recommended adoption of a three-phased approach (evaluation studies, project implementation, and follow-up monitoring and evaluation studies). Comprehensive collection of data began in the Hood River subbasin in late 1991, including information on the life history and production of stocks of anadromous salmonids returning to the Hood River subbasin (Olsen et al. 1994). Information collected for the Hood River Production Project (HRPP) was used to prepare an environmental impact statement evaluating the program's impact on the human environment (DOE and BPA 1996 a and b).

The HRPP is jointly implemented by the CTWS and the ODFW. Accordingly, the actions of this contract with ODFW represent one-half of the combined actions needed to complete the HRPP. We are currently collecting information on natural production, smolt to adult survival, escapement, harvest, life history, and several morphological and meristic parameters needed to characterize wild and hatchery stocks of summer and winter steelhead and natural and hatchery stocks of spring chinook salmon. Data collected to date has more accurately defined 1) the spatial distribution of spawning and rearing populations of anadromous salmonids; 2) the current status of indigenous populations of summer and winter steelhead; 3) potential impacts the historical subbasin hatchery program may have had on indigenous populations of fish; and 4) the status of presently available anadromous salmonid habitat in the subbasin. Data collected on this project has been summarized annually in the following progress reports: Olsen et al. 1994; Olsen et al. 1995; CTWS and ODFW 1996; and CTWS and ODFW, January 1998.

Monitoring and evaluation information has been used extensively to refine our approach to implementing the HRPP in a manner that will minimize the program's impact on indigenous populations of fish. Implementation of the O&M portion has resulted in some significant resource management improvements, including a major switch in the hatchery steelhead broodstock used for Hood River releases, from out of basin stocks (Big Creek and Skamania stocks) to the Hood River indigenous stocks. In 1993 wild Hood River winter steelhead were selected from throughout the entire run at the Powerdale fish ladder and were subsequently matrix spawned to maximize potential genetic diversity. Out-of-basin origin winter steelhead have not been passed upstream from Powerdale Dam since 1993, in order to protect the genetic integrity of the wild Hood River spawners (CTWS and ODFW, January 1998). In addition, ODFW has implemented the Oregon Wild Fish Management Policy, which states that Hood River stock hatchery winter steelhead can comprise no more than 50% of the total spawner population. Hood River wild summer steelhead were first collected for broodstock during the 1997-98 run. Hatchery origin (Skamania stock) summer steelhead are now prevented from migrating upstream beyond Powerdale Dam. ODFW implemented mandatory wild steelhead release angling regulations within the subbasin beginning in 1992 to maximize protection of the depressed wild stocks during the subbasin sport fishery. Winter steelhead and spring chinook salmon smolts have been acclimated and volitionally released into the Hood River subbasin since

1996 (CTWS and ODFW, January 1998). Preliminary acclimation results are encouraging. Hood River mainstem screw trap catch comparisons (expanded) of winter steelhead between two years of unacclimated releases and three years of acclimated and volitional releases have shown the following results:

<u>Unacclimated</u>	<u>Acclimated</u>
1994 - 32.1% caught	1996 - 73.3% caught
1995 - 38.1%	1997 - 81.6%
	1998 - about 80%

This information suggests hauling related stress losses may be reduced with acclimation and /or residualism is significantly reduced with acclimation. Because screw traps are taken out of the river in early November, it's unknown at this time what percent of winter steelhead hatchery smolts remain in the stream.

e. Proposal objectives

Coordination. The program manager and coordinator represents CTWS on all HRPP activities. As the program is implemented it is vital to the success of the program to have all activities of the six individual projects of the HRPP (8902900, 9500700, 8805304, 9301900, 8805303, 9802100) be closely coordinated. The coordinator will be involved in the following activities: monitoring and evaluation, research, habitat restoration, and fish culture. In addition, there are many outside entities involved in the project and their participation over the next several years will be critical. Funding and program oversight is through BPA. Besides CTWS and BPA, other entities involved in the project include the ODFW, Hood River Watershed Group, PacifiCorp, Portland General Electric, USFS, NPPC, and the CBFWA. Other staff coordination efforts includes periodically re-evaluating management plans; producing informational reports to agencies and public on project activities; preparing annual and quarterly project reports to BPA; updating and modifying the Hood River Fish Habitat Plan (a working document); and coordinating and overseeing fish habitat projects under project number 9802100.

Objective 1. Determine abundance, distribution, and life history patterns, of anadromous and resident fishes.

Null Hypothesis 1: Implementation of the HRPP has not significantly increased wild steelhead smolt production in the Hood River subbasin.

Alternative: Implementation of the HRPP has significantly increased wild steelhead smolt production in the Hood River subbasin.

Null Hypothesis 2: Implementation of the HRPP has not successfully reintroduced a naturally producing population of spring chinook salmon in the Hood River subbasin.

Alternative: Implementation of the HRPP has successfully reintroduced a naturally producing population of spring chinook salmon in the Hood River subbasin.

Null Hypothesis 3: Implementation of the HRPP has significantly altered the life history patterns of indigenous populations of anadromous salmonids in the Hood River subbasin.

Alternative: Implementation of the HRPP has not significantly altered the life history patterns of indigenous populations of anadromous salmonids in the Hood River subbasins.

Null Hypothesis 4: Implementation of the HRPP has significantly altered the morphometric and meristic characteristics of indigenous populations of anadromous salmonids in the Hood River subbasin.

Alternative: Implementation of the HRPP has not significantly altered the morphometric and meristic characteristics of indigenous populations of anadromous salmonids in the Hood River subbasin.

Null Hypothesis 5: Hatchery acclimation facilities has not significantly increased numbers of hatchery smolts leaving the Hood River subbasin.

Alternative: Hatchery acclimation facilities has significantly increased numbers of hatchery smolts leaving the Hood River subbasin.

Null Hypothesis 6: Median outmigration of hatchery acclimated smolts is not significantly different to wild or naturally produced smolts.

Alternative: Median outmigration of hatchery acclimated smolts is significantly different to wild or naturally produced smolts.

Null Hypothesis 7: Spawner distribution is not significantly different for hatchery jack and adult fish returning from experimental groups of acclimated and direct released hatchery smolts.

Alternative: Spawner distribution is significantly different for hatchery jack and adult fish returning from experimental groups of acclimated and direct released hatchery smolts.

Null Hypothesis 8: Acclimated smolts do not have a significantly higher smolt to adult survival rate than direct released smolts.

Alternative: Acclimated smolts do have a significantly higher smolt to adult survival rate than direct released smolts.

Objective 2. Identify the population genetic structure, systematics, and distribution of genetically unique steelhead, cutthroat, and resident trout populations in the Hood River subbasin.

Null Hypothesis 1: Implementation of the HRPP has significantly altered the genetic makeup of indigenous populations of fish.

Alternative: Implementation of the HRPP has not significantly altered the genetic makeup of indigenous populations of fish.

Null Hypothesis 2: The genetic makeup of the hatchery broodstock significantly deviates from the corresponding native population from which it was derived.

Alternative: The genetic makeup of the hatchery broodstock does not significantly deviate from the corresponding native populations from which it was derived.

The analysis has been contracted to Dr. Fred Allendorf at the University of Montana through the genetics program at ODFW. This is a cost share between CTWS (BPA funding), USFS (other federal funding), and ODFW (ODFW and BPA funding). Genetic fish samples were collected in 1995 and 1996 by ODFW and CTWS research staff (Lambert et al. 1997). Data will be summarized and analyzed in a completion report.

Objective 3. Develop fish culture procedures for steelhead and spring chinook to minimize future genetic impacts to the wild gene pools in the Hood River subbasin.

Null Hypothesis: None.

Alternative: None.

Objective 4. Achieve an interim run of 850 jack and adult spring chinook salmon to the Hood River, with a spawner escapement of 400 jacks and adults.

Null Hypothesis: None.

Alternative: None.

Objective 5. Achieve an interim run of 2,340 summer steelhead to Hood River, with a spawner escapement of 1,000 (500 wild and 500 hatchery) Hood River stock.

Null Hypothesis: None.

Alternative: None.

Objective 6. Achieve an interim run of 2,785 winter steelhead to Hood River, with a spawner escapement of 1,000 (500 wild and 500 hatchery) Hood River stock.

Null Hypothesis: None.

Alternative: None.

Objective 7. Determine the amount and condition of habitat available to anadromous salmonids in the Hood River subbasin.

Null Hypothesis: None.

Alternative: None.

Current smolt carrying capacity in the Hood River subbasin was determined by the subbasin planners using a computer simulation model developed by the NPPC called the Tributary Parameters Model (TPM)[NPPC 1989]. Current numbers of summer and winter steelhead and spring chinook salmon smolts migrating from the Hood River subbasin are far less than numbers estimated by the subbasin planners as the smolt carrying capacity. This low seeding level tends to support the need for supplementation. The HRPP will continue to refine carrying capacity numbers to determine if the Hood River Master Plan's run size and spawner escapement goals are achievable (O'Toole P. and ODFW 1991a). **Constraints:** There is currently no methodology available for directly estimating carrying capacity that can be accomplished both in a relatively short time frame and at a low cost to the funding agency. We propose expanding on the TPM's concept by refining several parameters in the model based on stock specific information (CTWS and ODFW, cooperators, January 1998).

Objective 8. Restore and recover habitat lost as a consequence of man's activities in the Hood River subbasin.

Null Hypothesis: None.

Alternative: None.

Objective 9. Review measures of relative "smolt quality" between spring chinook salmon smolts reared in Pelton Ladder (old and new sections) and those reared at Round Butte

Hatchery (RBH) as inference that ladder-reared smolts may have superior “fitness” for survival.

Null Hypothesis: Juvenile chinook salmon reared at Pelton Ladder do not have a significantly higher smolt to adult survival rate than those reared at RBH.

Alternative: Juvenile chinook salmon reared at Pelton Ladder do have a significantly higher smolt to adult survival rate than those reared at RBH.

Objective 10. Conduct controlled tests to define effective smolt production criteria that maximizes spring chinook salmon adult returns.

Null Hypothesis 1: Juvenile chinook salmon transferred to Pelton Ladder in September versus November do not have a significantly higher smolt-to-adult survival rate than those reared at RBH.

Alternative: Juvenile chinook salmon transferred to Pelton Ladder in September versus November have a significantly higher smolt-to-adult survival rate than those reared at RBH.

Null Hypothesis 2: Mean size at release of ladder-reared smolts will not significantly affect smolt-to-adult survival rates.

Alternative: Mean size at release of ladder-reared smolts will significantly affect smolt-to-adult survival rates.

Null Hypothesis 3: Mean size at release of hatchery-reared (RBH) smolts will not significantly affect smolt-to-adult survival rates.

Alternative: Mean size at release of hatchery-reared (RBH) smolts will significantly affect smolt-to-adult survival rates.

Objective 11. Measure survival of smolts produced in the (new) modified sections of Pelton Ladder and compare to (old) established pre-modification survival rates.

Null Hypothesis 1: Survival rates of smolts produced in the old section of Pelton Ladder prior to the new production facilities in Pelton Ladder are not significantly different from the survival rates of smolts produced after the new production facilities are brought online.

Alternative: Survival rates of smolts produced in the old section of Pelton Ladder prior to the new production facilities in Pelton Ladder are significantly different from the survival rates of smolts produced after the new production facilities are brought online.

Null Hypothesis 2: Smolt to adult survival rates in the new section of Pelton Ladder are not significantly different from smolt to adult survival rates in the old section of Pelton Ladder.

Alternative: Smolt to adult survival rates in the new section of Pelton Ladder are significantly different from smolt to adult survival rates in the old section of Pelton Ladder.

Objective 12. Evaluate the effective production potential of the currently, unused area in Pelton Ladder.

Null Hypothesis: Effective production potential does not exist in the currently unused section of Pelton Ladder. Alternative: Effective production potential does exist in the currently unused section of Pelton Ladder.

f. Methods

- Objective 1)**
- a. Estimate juvenile rearing distribution of anadromous and resident species.
 - b. Estimate rearing densities or relative abundance of juvenile anadromous salmonids and resident trout in selected reaches.
 - c. Estimate spatial distribution or rearing juvenile anadromous salmonids and resident trout.
 - d. Estimate selected morphometric characteristics of resident trout.

Downstream migrant rainbow-steelhead (rb-st), spring chinook salmon smolts, and summer and winter steelhead smolts will be trapped at a rotary-screw trap located at approximately Rm 4.5 in the mainstem Hood River. The screw traps will be sampled on a daily basis. A pooled Peterson estimate with Chapman's modification will be used to estimate numbers of downstream migrants, by size category (CTWS and ODFW, cooperators, January 1998). Approximate 95% confidence intervals will be calculated. A three pass and two pass removal method are used to estimate population numbers at selected index sites within the Hood River subbasin (Zippin 1958; Seber and Whale 1970). Electrofishing and snorkeling methods are used to complete fish distribution surveys throughout the Hood River subbasin. Constraints: ODFW have effectively operated downstream migrant screw traps from 1994-1997. Highly variable streamflows in the Hood River subbasin could limit the ability to obtain adequate sample sizes to accurately estimate specific parameters but we do not anticipate any constraints limiting ability to satisfactorily achieve the state objective.

- e. Assist ODFW in enumeration of all species of upstream migrant anadromous salmonids at Powerdale Dam.

Upstream migrant wild, natural, and hatchery produced jack and adult anadromous salmonids will be trapped at an adult migrant trap located in the mainstem Hood River at Powerdale Dam (Rm 4.5). The trapping facility will be operated daily, to weekly, throughout the year. See CTWS and ODFW, cooperators, January 1998 for detailed methods. Constraints: The adult trapping facility at Powerdale Dam has been successfully operated since December 1991. We do not anticipate any constraints limiting ability to achieve the stated objective.

- f. Assist ODFW in monitoring naturally produced and acclimated hatchery produced smolt outmigration timing at migrant traps.
- g. Evaluate if acclimation facilities have significantly increased numbers of hatchery smolts leaving the Hood River subbasin.

- h. Estimate and compare median date of outmigration for naturally produced and acclimated hatchery produced smolts.
- i. Evaluate significance of “residualism” using electrofishing and snorkel surveys.
- j. Determine if acclimated hatchery spring chinook salmon adult returns distribute throughout the West Fork and utilize primary spawning areas.
- k. Determine if acclimated smolts have a significantly higher smolt to adult survival rate in relation to direct released smolts.

The project will be acclimating all hatchery spring chinook salmon and summer steelhead on the West Fork and hatchery winter steelhead on the East Fork using portable acclimation raceways (**objectives 4-6**). The portable raceways will be gravity fed and fish will be volitionally released. Evaluation of these fish will occur as described above except for task j. To evaluate task j, spawning ground surveys will be completed on the West Fork Hood River. Data collection includes redds, carcasses, live fish, and river miles associated with each. Fish are also checked for spawning success and disease. For additional methodology see CTWS and ODFW, cooperators, January 1998.

- l. Coordination of all monitoring and evaluation activities. Provide informational reports to agencies and public on project activities. Prepare BPA quarterly and annual reports.

Objective 2) a. Provide support to conduct laboratory work on the electrophoretic and mtDNA analysis. (Described in section e, proposal objectives).

Objective 3) a. Periodically re-evaluate the Hood River/Pelton Ladder Production Program Management Plans and broodstock collection, spawning, and adult fish passage protocol for summer and winter steelhead and spring chinook salmon to minimize future genetic impacts.

Objective 4) a. Volitionally release acclimated spring chinook salmon hatchery smolts into the Hood River subbasin.
b. Coordinate clipping and coded-wire tagging operations for hatchery releases into the Hood.

Objective 5) a. Volitionally release acclimated summer steelhead hatchery smolts into the Hood River subbasin.
b. Coordinate clipping and coded-wire tagging operations for hatchery releases into the Hood.

Objective 6) a. Volitionally release acclimated winter steelhead hatchery smolts into the Hood River subbasin.
b. Coordinate clipping and coded-wire tagging operations for hatchery releases into the Hood.

- Objective 7)** a. Monitor selected environmental factors that may effect carrying capacity.
b. Estimate the quantity and quality of habitat available for spring chinook salmon and summer and winter steelhead.
c. Re-evaluate and refine smolt carrying capacity.
d. Monitor water quality.
e. Complete physical stream habitat surveys.

Brief methodology described in section e, proposal objectives. See CTWS and ODFW, cooperators, January 1998 for detailed methods.

- Objective 8)** a. Plan, coordinate, and implement habitat projects from the Hood River Habitat Restoration/Protection Plan working document. Seek cost share funds for all projects.
b. Continue to update and modify the habitat protection, restoration, and monitoring plan. Incorporate components of the watershed assessments, completed by the Hood River Watershed Group with HRPP support, and the USFS.

- Objective 9)** a. Utilize past data from several broods of ladder reared and RBH reared smolts. Compile and analyze data to provide a comparison of relative “fitness” between the groups of fish.
b. Determine and compare smolt survival and condition of fish in Pelton Ladder.
c. Summarize and report jack and adult life history and morphological data on Deschutes River stock spring chinook salmon released from Pelton Ladder and RBH.
d. Determine and compare smolt to adult survival rates of similar sized smolts released at the same time from RBH and Pelton Ladder.

- Objective 10)** a. Determine and compare smolt to adult survival of fish transferred to Pelton Ladder in September and November.
b. Determine and compare smolt to adult survival rates of small (12/lb) and medium (8/lb) size smolts reared at RBH.
c. Determine and compare smolt to adult survival rates of small (12/lb) and medium (8/lb) size smolts reared at RBH.
d. Document fish culture activities that occur at RBH and Pelton Ladder.
e. Coordinate (assist) with RBH staff in sampling fish at the hatchery and ladder for condition prior to release.
f. Coordinate (assist) with RBH staff in retrieving coded-wire tags from jack and adult spring chinook salmon at the Pelton Trap.

- Objective 11)** a. Determine and compare smolt to adult survival of the old section with the new section of the ladder.

Objective 12) a. Measure adult returns provided by the new modifications to Pelton Ladder to gain inferences about the potential value of further extending production in the ladder.

An adult collection facility (Pelton Adult Trap) will be operated on the Deschutes River. Numbers from the Pelton Adult Trap, along with expanded Indian and sport catch figures from the Deschutes River creels, will be used to monitor adult escapement. Comparisons among Pelton Ladder cells and RBH ponds (**objectives 9-12**) are based on smolt-to-adult survival. For additional information see CTWS and ODFW, cooperators, January 1998.

g. Facilities and equipment

The HRPP (CTWS and ODFW) monitoring and evaluation projects have been collecting baseline information on the Hood River subbasin since 1991, and is in the third year of implementation following completion of the EIS. This project is currently being operated out of a field station in The Dalles, Oregon. The field station provides an office, conference room, storage area, and parking. The shop is supplied with mechanical tools required to repair and maintain acclimation facilities and other field equipment used by this project. This project has four field vehicles necessary for travel.

All major office supplies and most field equipment, needed to implement this project, have been purchased under previous contracts. Major office supplies include three computers and associated software, FAX machine, copier, two injet printers, typewriter, slide projector, overhead transparency machine, color tv, camcorder, desks, chairs, and filing cabinets. Major equipment includes portable acclimation ponds and liners; two gasoline pumps; 1200 ft of 8", 1700 ft of 6", and 700 ft of 4" PVC sewer pipe and fittings; valves, four electrofishers, chainsaw, two DO meters, 10 Hobo Temp's, digital hanging scale, CWTag detectors, 400 watt generator, and other miscellaneous field equipment.

h. Budget

The CTWS M&E project requires five full-time employees (Program Coordinator, Project Leader, two fishery technicians, and a secretary) and three months of CTWS Program Manager support and oversight to complete monitoring and evaluation, acclimation, habitat, and coordination efforts for Pelton Ladder and the Hood River subbasin (**Objectives 1-12**).

Supplies, materials, and non-expendable property is primarily acclimation equipment (pipe, fittings, seals, grease, glue, lumber, valves, couplers, backup aeration system, intake box, trailer rentals, portable toilet rentals, and minor equipment and tools); additional field equipment is budgeted to complete monitoring and evaluation activities.

The travel budget includes 4 vehicle rentals and mileage for work activities. Also included is per diem, air fare, vehicle insurance, and employee training.

The capital acquisition for \$12,000 is to purchase a radio repeater and equipment for placement in the Hood River subbasin. A radio system is necessary to provide emergency service during spring chinook salmon and winter and summer steelhead acclimation and monitoring and evaluation activities on the Hood. During acclimation, caretakers are onsite 24hr/day to maintain fish acclimation ponds and prevent vandalism.

Money budgeted under subcontractor includes \$20,000 for genetic studies (**Objective 2**) and \$21,200 for acclimation (**Objectives 4-6**); which includes overnight caretakers, snow plowing, site prep, and sand.

Section 9. Key personnel

MICK JENNINGS

3430 W 10th Street
The Dalles, OR 97058

EDUCATION

B.S. in Fisheries Science 1965

Dept. of Fisheries and Wildlife
Oregon State University, Corvallis, OR

PROFESSIONAL EXPERIENCE

CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION OF OREGON

The Dalles, Oregon. March, 1995 to present. Salaried-40+hrs/week.

Job Title: **Program Coordinator, Hood River Production Program**

Duties: This position oversees the Tribal portion of the Hood River Production Program (HRPP), a Bonneville Power Administration funded program which is to restore anadromous fish runs in Hood River. Duties include oversight of project administration, engineering, construction, monitoring and evaluation of Hood River research, habitat evaluation and fish culture. This position updates Tribal Fish and Wildlife Committee, Tribal Council, Northwest Power Planning Council and others on progress of HRPP. This position budgets and administers a \$500,000 monitoring and evaluation contract of Hood River research and supervises a staff of five full-time and three seasonal employees in an office in The Dalles, Oregon.

OREGON DEPARTMENT OF FISH AND WILDLIFE

Portland, Oregon. April, 1990 to February, 1995. Salaried 40+hrs/week.

Job Title: **Steelhead Program Leader**

Duties: This position directs, guides and assists the regions in the Department to implement a Statewide Steelhead Management program. Major duties consist of providing

programmatic direction by coordinating the implementation of the policies, objectives and guidelines contained in the Statewide Steelhead Plan; preparing quarterly program progress reports, annual Steelhead Report, and other special reports and news releases; preparing and monitoring biennial budget; directing the research necessary to implement the Steelhead Plan; directing staff involved in collection and analysis of fisheries data; coordination of projects affecting steelhead resources; and providing guidance to Department personnel responsible for implementing the Steelhead Plan on state-of-the-art steelhead management techniques.

OREGON DEPARTMENT OF FISH AND WILDLIFE

Roseburg-Grants Pass, Oregon

Job Title: **District Fish Biologist**, June, 1982 to March, 1990. Salaried-40+hrs/week.

Assistant District Fish Biologist, November, 1966 to May, 1982. 40hrs/week

Duties: Management biologist responsible developing, planning, supervising, analyzing and completing various fish management programs in the district. Approximately 60 percent of activities involved habitat protection and restoration. A considerable amount of the habitat restoration activities involved adult and juvenile fish passage issues.

Improvements to artificial fish passage barriers that I assisted in design and personally worked on included Little Butte Dam, Fielder Dam, Waters Creek Dam, Savage Rapids Dam, Kane Creek culvert, and Wimer Dam. I was continually evaluating fish passage at the approximately 100 small dams in the Rogue Basin. Also, a major part of my duties was spent supervising the fish screens program in the upper Rogue where over 150 rotary screens were in operation. Coordinated stream habitat restoration projects with the five USFS ranger districts that I worked with were routinely reviewed and evaluated for fishery resource benefits.

PUBLICATIONS/JOB COMPLETIONS

Steelhead Plan, Oregon Department of Fish and Wildlife, Wade M., et al. 1995. This is a comprehensive plan for production and management of Oregon's anadromous steelhead. I was the primary person responsible for its development and completion, including setting up and overseeing technical and public advisory committees, incorporating comments and developing support of co-managers and the public, and finally adoption by the Fish and Wildlife Commission. This process took about 18 months.

Hooton, B., Jacobs S., Jennings, M., Kostow, K., McPherson, B., Nickelson T., Smith, A., Weeks, H. 1995. Biennial report on the status of wild fish in Oregon. Oregon Department of Fish and Wildlife. Portland, Oregon. 217 p.

Lambert, M. B., Jennings, M., O'Toole, P. 1995. Hood River and Pelton Ladder evaluation studies. Annual Progress Report (Project 88-053-03) of the Confederated Tribes of the Warm Springs Reservation of Oregon. In cooperation with Oregon Department of Fish and Wildlife. Report B, pages 173-285 to Bonneville Power Administration, Portland. Oregon.

Lambert, M.B., Jennings, M., McCanna J. 1996. Hood River and Pelton Ladder evaluation studies. Annual Progress Report (Project 88-053-03) of the Confederated Tribes of the Warm Springs Reservation of Oregon. In cooperation with Oregon Department of Fish and Wildlife. Report B, pages 163-257 to Bonneville Power Administration, Portland, Oregon.

Lambert, M.B., McCanna J., Jennings, M. In Print. Hood River and Pelton Ladder evaluation studies. Annual Progress Report (Project 88-053-03) of the Confederated Tribes of the Warm Springs Reservation of Oregon. In cooperation with Oregon Department of Fish and Wildlife. Report B to Bonneville Power Administration, Portland, Oregon.

MICHAEL LAMBERT

3430 W 10th Street
The Dalles, OR 97058

EDUCATION:

B.S. in Biology 1992

Western Oregon State College, Monmouth, OR

PROFESSIONAL EXPERIENCE:

THE CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION OF OREGON, The Dalles, OR; March 1995 to present. Salaried-40+hrs/week.

Job Title: Fisheries Project Leader

Duties: This position reports to the Program Coordinator. This position is responsible for coordinating and implementing field activities for the Hood River Production Program M & E and Habitat Projects. M & E activities include: determining abundance, distribution, and life history patterns for anadromous and resident fishes; overseeing genetic sampling and developing a comprehensive genetic monitoring and evaluation plan; evaluating ecological interactions of wild/natural fish and hatchery fish; oversee smolt acclimation ponds (setup and operations) and experimental design to determine effectiveness of acclimation of spring chinook salmon and winter and summer steelhead smolts; implement hatchery fish culture monitoring/coordination; and oversee Pelton Ladder (Deschutes River) spring chinook smolt survival studies between the newly modified sections and old established sections of the ladder. Have been overseeing habitat restoration/protection and implementation activities on the Hood River. Compile, summarize, and analyze data collected, and prepare monthly/annual reports for the HRPP.

OREGON DEPARTMENT OF FISH AND WILDLIFE, Various locations.

Job Title: Experimental Biologist Aide - Fisheries

Hermiston, OR; November 1994 through February 1995; hourly-40hrs/week.

Tillamook, OR; October 1994 through November 1994; hourly-40hrs/week.

Port Orford, OR; October 1993 through January 1994; hourly-40hrs/week.

LaGrande, OR; June 1993 through September 1993; hourly-40hrs/week.

Hermiston, OR; February 1993 through June 1993; hourly-40hrs/week.

Pendleton, OR; June 1990 through September 1990; hourly-40hrs/week.

Pendleton, OR; June 1989 through September 1989; hourly-40hrs/week.

Duties (relevant): Collected and summarized data on abundance, distribution, and life history information for anadromous and resident fishes. Techniques of field collection were adult upstream migration traps, screw traps, electroshocking, snorkeling, fyke nets, and etc. Various habitat work, including physical stream habitat surveys; planning, constructing, and maintaining stream riparian fence enclosures; revegetated degraded riparian zones for quicker recovery; and assisted in preparation and construction of a concrete weir built for improving upstream fish passage.

PACIFIC STATES MARINE FISHERIES COMMISSION, LaGrande, OR; March 1994 through July 1994; hourly-40hrs/week Job Title: **Biological Assistant - Fisheries**

Duties: Collected and summarized research data on downstream migrant anadromous salmonids leaving the Grande Ronde Basin using a migrant screw trap. A portion of collected fish were PIT-tagged. Research data was used to determine abundance, outmigration timing, and additional life history information.

U.S. FOREST SERVICE - LAMBERT & BEEN, ET AL, Pendleton, OR; May 1992 through December 1992 and May 1991 through February 1992; contracted payment-averaged 46hrs/week.

Job Title: **Private Contractor - Stream Habitat And Fish Surveys**

Duties: Completed over 200 miles of stream habitat and fish surveys documenting: stream channel characteristics and morphology; riparian zone vegetation; fish identification, population, location, barriers, and enhancement opportunities; and wildlife existence. Wrote final reports for each stream surveyed, and within each report documented habitat enhancement and rehabilitation opportunities. Management tasks included overseeing \$140,000 budget (between two contracts), negotiating with USFS contracting officers, and training and distributing job duties to staff.

PUBLICATIONS/JOB COMPLETIONS

Completed the FY 1997 HRPP tribal contract for BPA(project number 89-053-03), currently working on the 1997 HRPP Annual Report.

Completed the FY 1995 and 1996 HRPP tribal contracts for BPA(project number 89-053-03). In addition, FY 1995 and 1996 HRPP Annual Reports have been published by BPA.

Lambert, M. B., Jennings, M., O'Toole, P. 1995. Hood River and Pelton Ladder evaluation studies. Annual Progress Report (Project 88-053-03) of the Confederated Tribes of the Warm Springs Reservation of Oregon. In cooperation with Oregon Department of Fish and Wildlife. Report B, pages 173-285 to Bonneville Power Administration, Portland. Oregon.

Lambert, M.B., Jennings, M., McCanna J. January 1998. Hood River and Pelton Ladder evaluation studies. Annual Progress Report (Project 88-053-03) of the Confederated Tribes of the Warm Springs Reservation of Oregon. In cooperation with Oregon Department of Fish and Wildlife. Report B, pages 163-257 to Bonneville Power Administration, Portland, Oregon.

Lambert, M.B., McCanna J., Jennings, M. In Print. Hood River and Pelton Ladder evaluation studies. Annual Progress Report (Project 88-053-03) of the Confederated Tribes of the Warm Springs Reservation of Oregon. In cooperation with Oregon Department of Fish and Wildlife. Report B to Bonneville Power Administration, Portland, Oregon.

Section 10. Information/technology transfer

Project planning, implementation, and continued monitoring of the project will be summarized within the HRPP CTWS Annual Report for BPA (Project 89-053-03). Project information will be presented to the co-managers (ODFW), public, outside agency staff, NPPC, CBFWA, BPA, and the Hood River Watershed Group through oral presentations and local newspaper reports.

Congratulations!